

Claims

1-32. (withdrawn)

33. (original) A sampler, comprising:

a signal conductor;

a sampling diode in electrical communication with the signal conductor; and

a non-linear transmission line that includes a non-parallel waveguide and a plurality of varactors, the non-linear transmission line configured to deliver sampling strobe pulses to the sampling diode.

34. (original) The sample of claim 33, further comprising an intermediate frequency (IF) waveguide configured to electrically connect to the signal conductor as controlled by the sampling diode.

35. (original) The sampler of claim 34, further comprising a measurement system configured to receive portions of an electrical signal applied to the signal conductor from the IF waveguide.

36. (original) The sampler of claim 35, wherein the measurement system is configured to produce an equivalent-time representation of the electrical signal.

37. (original) The sampler of claim 34, further comprising a measurement system configured to receive portions of an electrical signal applied to IF waveguide from the signal conductor.

38. (original) The sampler of claim 37, wherein the measurement system is configured to produce an equivalent-time representation of the electrical signal.

39. (original) The sampler of claim 33, wherein the non-linear transmission line includes a plurality of Schottky mesa diodes.

40. (original) The sampler of claim 33, wherein the non-parallel waveguide includes at least one periodically repeated waveguide section.

41. (original) The sampler of claim 33, further comprising a strobe waveguide transition configured to receive the sampling strobe pulses from the non-linear transmission line and to deliver enhanced strobe pulses to the sampling diode.

42. (original) The sampler of claim 33, wherein the non-parallel waveguide is a slotline.

43. (original) The sampler of claim 33, wherein the non-parallel waveguide is a coplanar stripline.

44. (currently amended) A sampling circuit, comprising:

a first nonparallel waveguide configured to receive a sampling strobe and having a first impedance;

a second nonparallel waveguide configured to receive the sampling strobe from the first nonparallel waveguide and having a second impedance, wherein the first impedance and the second impedance are configured to produce an enhanced sampling strobe; and

at least one diode electrically controlled by the sampling strobe and configured to deliver a sampled portion of an input signal to an output conductor.

45. (currently amended) The sampling circuit of claim 44, wherein the second nonparallel waveguide includes a termination configured to direct an inverted portion of the enhanced sampling strobe to the sampling diode, thereby establishing a sampling window.

46. (currently amended) The sampling circuit of claim 45, wherein the first nonparallel waveguide and the second nonparallel waveguide are slotlines.

47. (original) The sampling circuit of claim 45, further comprising an IF waveguide configured to deliver the sampled portion to the output conductor.

48-52. (withdrawn)

53. (new) A sampler, comprising:

a signal conductor;
a sampling diode in electrical communication with the signal conductor; and
a non-linear transmission line that includes a non-parallel waveguide and a plurality of varactors, the non-linear transmission line configured to deliver sampling strobe pulses to the sampling diode, wherein the non-parallel waveguide includes at least one periodically repeated waveguide section.

54. (new) The sampler of claim 53, further comprising an intermediate frequency (IF) waveguide configured to electrically connect to the signal conductor as controlled by the sampling diode.

55. (new) The sampler of claim 54, further comprising a measurement system configured to receive portions of an electrical signal applied to the signal conductor from the IF waveguide.

56. (new) The sampler of claim 55, wherein the measurement system is configured to produce an equivalent-time representation of the electrical signal.

57. (new) The sampler of claim 54, further comprising a measurement system configured to receive portions of an electrical signal applied to IF waveguide from the signal conductor.

58. (new) The sampler of claim 57, wherein the measurement system is configured to produce an equivalent-time representation of the electrical signal.

59. (new) The sampler of claim 53, wherein the non-linear transmission line includes a plurality of Schottky mesa diodes.

60. (new) The sampler of claim 53, further comprising a strobe waveguide transition configured to receive the sampling strobe pulses from the non-linear transmission line and to deliver enhanced strobe pulses to the sampling diode.

61. (new) The sampler of claim 63, wherein the non-parallel waveguide is a slotline.

62. (new) The sampler of claim 53, wherein the non-parallel waveguide is a coplanar stripline.

63. (new) A sampler, comprising:
a signal conductor;
a sampling diode in electrical communication with the signal conductor; and
a non-linear transmission line that includes first, second, and third non-parallel waveguide sections having first, second, and third characteristic impedances, respectively, and a plurality of varactors, the non-linear transmission line configured to deliver sampling strobe pulses to the sampling diode.

64. (new) The sample of claim 63, further comprising an intermediate frequency (IF) waveguide configured to electrically connect to the signal conductor as controlled by the sampling diode.

65. (new) The sampler of claim 64, further comprising a measurement system configured to receive portions of an electrical signal applied to the signal conductor from the IF waveguide.

66. (new) The sampler of claim 65, wherein the measurement system is configured to produce an equivalent-time representation of the electrical signal.

67. (new) The sampler of claim 64, further comprising a measurement system configured to receive portions of an electrical signal applied to IF waveguide from the signal conductor.

68. (new) The sampler of claim 67, wherein the measurement system is configured to produce an equivalent-time representation of the electrical signal.

69. (new) The sampler of claim 63, wherein the non-linear transmission line includes a plurality of Schottky mesa diodes.

70. (new) The sampler of claim 63, wherein at least one of the non-parallel waveguide sections is periodically repeated.

71. (new) The sampler of claim 63, further comprising a strobe waveguide transition configured to receive the sampling strobe pulses from the non-linear transmission line and to deliver enhanced strobe pulses to the sampling diode.

72. (new) The sampler of claim 63, wherein the non-parallel waveguide is a slotline.

73. (new) The sampler of claim 63, wherein the non-parallel waveguide is a coplanar stripline.